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Sorcha O'Callaghan

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EXAMINER

MAIS, MARK A

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/818,670	<b>Applicant(s)</b> O'CALLAGHAN ET AL.	
	<b>Examiner</b> MARK A. MAIS	<b>Art Unit</b> 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (USP 5,917,819).

3. With regard to claim 13, Yang et al. discloses a network switch [**Abstract; Fig. 1, packet switch 8 receives packets which include a header used for determining I/O modules, col. 2, lines 39-51**] comprising:

a look-up engine [**Fig. 1, interpreted as the combination of the translation circuit 18 with identifier table 20 (col. 2, lines 38-45) and the CID/bitmask lookup table 14 (col. 2, lines 38-45); translation circuit 18 performs identifier lookup of the packet, col. 2, lines 38-45**] operative to retrieve a port bitmask in response to a header portion of a received packet [**Fig. 3, IOM field 30 and multicast ID 28 are interpreted as a bitmask, col. 3, lines 20-27; Fig. 6, steps 70 and 72 disclose that the interpreted bitmask determines the respective IOM, col. 4, line 64 to col. 5, line 25**] and to forward the received packet only in response to receiving a

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modified port bitmask [forwarding the packet to the appropriate IOMs for transmission, col. 1, lines 48-57; Fig. 6, using CID/bitmask lookup table 14 in step 80 (get new CID) for bitmask overlay wherein step 82 (CID's three LSBs each equal "0") constitutes a modification indication, col. 5, line 40 to col. 6, line 3; a sequential operation of multicast block 66 as part of the retrieval followed by step 76 (get port bitmap) and step 80 (get new CID) as parts of the modification necessitates that the processor can only forward the packet after receiving the modification indication, col. 5, line 12 to col. 5, line 18];

a network processor operable to perform a processing function [Fig. 1, interpreted as the combination of the translation circuit 18 with identifier table 20 (col. 2, lines 38-45) and the CID/bitmask lookup table 14 (col. 2, lines 38-45); which further performs a processing function], in response to at least one of said received packet and said port bitmask, to generate the modified port bitmask [Fig. 4, CID/bitmask lookup table 14 is referenced and the subsequent CID 48 is overlaid onto the multicast ID, col. 3, line 60 to col. 4, line 12] and to provide the modified port bitmask to the lookup engine.

Yang et al. does not specifically disclose a look-up engine and the network processor are separate processors [since they're both interpreted as the combination of the translation circuit 18 with identifier table 20 (col. 2, lines 38-45) and the CID/bitmask lookup table 14 (col. 2, lines 38-45)]. Yang et al. teaches that there is a need for using a port bitmasks for unicasting and/or multicasting and uses a modified port bitmask to forward packets as either single-port-multicast packets or multiport-multicast packets [Abstract]. It would have been obvious to separate the two functions to be performed by stand-alone processors because such methodologies have been performed in the past. Specifically, prior to the advent of processors

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capable of performing multiple super-high-speed functions, stand-alone processors performed simple functions/tasks because these dedicated processors performed these functions faster.

Moreover, figuring out how to perform such a function [header look-up and a processing function] encompasses a finite number of predictable potential solutions to this recognized problem of multicasting/broadcasting functions within a switch. Known solutions include, for example, (1) brute-force parallel processing of each packet and replication for multicast/broadcast packets; (2) stripping all headers from payloads and massive parallel processing of the stripped headers and replicating payloads for multicasting/broadcasting; (3) using Patricia tries for forwarding/routing table processing to reduce processing “costs” (time and money); and (4) creating  $2^n$  hash tables using bitmasks to also reduce processing “costs”. A person of ordinary skill at the time of the invention could have pursued the known potential solutions with a reasonable expectation of success. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to have linked/connected a look-up engine to a network processor to perform port bitmasking functions because such a setup would allow the ATM switch in Yang et al. to map VPI/VCI pairs to specific (plural) ports for unicasting and/or multicasting/broadcasting using port bitmasking while reducing processing “costs” associated with massive parallel processing for all received packets.

4. With regard to claim 14, Yang et al. discloses that each of said lookup engine and said network processor receive a first indication that the packet has been received [**Abstract; Fig. 1, packet switch 8 receives packets which include a header used for determining I/O modules, col. 2, lines 39-51**].

5. With regard to claim 15, Yang et al. discloses that the look-up engine provides for said network processor a second indication, said second indication indicating that said port bitmask has been obtained [**Fig. 6, completion of first stage processing of a multicast block 66 including step 70 (setting IOM field) and step 72 (assigning multicast ID) with subsequent processing in step 73 (forward to switch fabric), col. 5, lines 15-40**].

6. With regard to claim 16, Yang et al. discloses that the network processor is operative, in response to said first indication, to execute said processing function [**Fig. 4, CID/bitmask lookup table 14 is referenced and the subsequent CID 48 is overlaid onto the multicast ID, col. 3, line 60 to col. 4, line 12**] and to provide to said look-up engine a third indication, said third indication indicating that said processing function has been executed [**Fig. 6, using CID/bitmask lookup table 14 in step 80 (get new CID) for bitmask overlay wherein step 82 (CID's three LSBs each equal "0") constitutes a second function indication, col. 5, line 40 to col. 6, line 3**].

7. With regard to claim 17, Yang et al. discloses that the network processor performs the processing function in parallel with the retrieving by the lookup engine [**inherent**].

8. With regard to claim 18, Yang et al. discloses that the lookup engine forward a plurality of copies of the received packet, each of the plurality of copies in response to one of a plurality of modified port bitmasks provided by the network processor [**Fig. 4, CID/bitmask lookup table**

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**14 is referenced and the subsequent CID 48 is overlaid onto the multicast ID, col. 3, line 60 to col. 4, line 12].**

9. With regard to claim 19, Yang et al. discloses that the lookup engine retrieve a port bitmask for a next received packet only after receiving said third indication[**Fig. 6, using CID/bitmask lookup table 14 in step 80 (get new CID) for bitmask overlay wherein step 82 (CID's three LSBs each equal "0") constitutes a second function indication, col. 5, line 40 to col. 6, line 3].**

10. With regard to claim 20, Yang et al. discloses that the third indication is said modified bitmask [**Fig. 6, using CID/bitmask lookup table 14 in step 80 (get new CID) for bitmask overlay wherein step 82 (CID's three LSBs each equal "0") constitutes a second function indication, col. 5, line 40 to col. 6, line 3].**..

11. With regard to claim 21, Yang et al. discloses that the third indication is sent based on a value of a replication pointer [**Abstract; mapping VPI/VCI pairs to specific (plural) ports for unicasting and/or multicasting/broadcasting using port bitmasking].**

*Response to Arguments*

12. Applicant's arguments filed on December 1, 2008 have been fully considered but they are not persuasive.

13. With respect to claim 13, Applicants state that Yang et al. fails to disclose modifying a bitmask much less a modified bitmask [See Applicants' Amendment dated December 1, 2008, page 5, paragraphs 1-2]. Applicants argue, apparently, that Yang et al. fails to disclose the claimed bitmask [See Applicants' Amendment dated December 1, 2008, page 5, paragraph 3 to page 6, paragraph 1]. Specifically, Applicants argue that the claimed bitmask cannot include the multicast identifier (MID) or connection identifier (CID) [See Applicants' Amendment dated December 1, 2008, page 5, paragraph 3 to page 6, paragraph 1]. The examiner respectfully disagrees.

14. First, as noted above in the rejection of claim 13, Yang et al. discloses IOM field 30 and multicast ID 28 which are interpreted as a bitmask [Fig. 3, col. 3, lines 20-27; Fig. 6, steps 70 and 72 disclose that the interpreted bitmask determines the respective IOM, col. 4, line 64 to col. 5, line 25]. Yang et al. further discloses forwarding the packet to the appropriate IOMs for transmission [col. 1, lines 48-57]. Using CID/bitmask lookup table 14 in step 80 (get new CID) for bitmask overlay wherein step 82 (CID's three LSBs each equal "0") constitutes a modification indication [Fig. 6, col. 5, line 40 to col. 6, line 3]. A sequential operation of multicast block 66 as part of the retrieval followed by step 76 (get port bitmap) and step 80 (get



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new CID) as parts of the modification necessitates that the processor can only forward the packet after receiving the modification indication [Fig. 6, col. 5, line 12 to col. 5, line 18]. Ultimately, CID/bitmask lookup table 14 is referenced and the subsequent CID 48 is overlaid onto the multicast ID [Fig. 4; col. 3, line 60 to col. 4, line 12].

15. Second, the claimed bitmask merely requires a modification. If Applicants are arguing that a specific modification occurs, such a limitation is not present in the claims. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that a specific modification occurs) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

16. Third, despite Applicants' argument to the contrary, the claim does not prevent the bitmask from being interpreted as including the MID and/or CID. If Applicants are arguing that the claimed bitmask cannot include the MID and/or CID (or cannot based on the VCI/VPI of an incoming cell), such a limitation is not present in the claims. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies [i.e., that the claimed bitmask cannot include the MID and/or CID (or cannot based on the VCI/VPI of an incoming cell)] are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the

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specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

17. Fourth, if Applicants are arguing that the claimed invention uses a specific bitmask (e.g., size, composition, method of identification, etc.), such a limitation is not present in the claims. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies [i.e., that the claimed invention uses a specific bitmask (e.g., size, composition, method of identification, etc.)] are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner notes the broadest reasonable interpretation with respect to Applicants' specification.

18. Fifth, if Applicants are arguing that the bitmask is part of a specific header and/or protocol (e.g., a 32 bit bitmask field in a specific protocol's header which contains the value for a specific bitmask to be used for processing), such a limitation is not present in the claims. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies [i.e., that the bitmask is part of a specific header and/or protocol (e.g., a 32 bit bitmask field in a specific protocol's header which contains the value for a specific bitmask to be used for processing)] are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26

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USPQ2d 1057 (Fed. Cir. 1993). The examiner notes the broadest reasonable interpretation with respect to Applicants' specification.

### ***Conclusion***

19. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

20. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(a) Patra et al. (USP 7,430,208), Efficient method for packet switching on Asynchronous Transfer Mode switch based platforms.

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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK A. MAIS whose telephone number is (571)272-3138. The examiner can normally be reached on M-Th 9am-8pm.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 20, 2009

/Mark A. Mais/

Examiner, Group Art Unit 2419

/Wing F. Chan/

Supervisory Patent Examiner, Art Unit 2419

1/21/09